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ABSTRACT

This booklet is the third in a series designed to assist parents who are home-schooling their adolescent children and focuses on providing instruction and experiences in reading, writing, and mathematics. The articles in this booklet are: (1) "Developing a Writer's Toolkit," discussing ways to incorporate techniques used by successful writers to develop a writing toolkit for adolescents; (2) "Encouraging Reading," making suggestions for stimulating teenagers to try more diverse and challenging reading materials; (3) "Rethinking Midschool/High School Math," contrasting traditional and integrated mathematics instruction and recommending an approach integrating textbook math with hands-on and recreational math; and (4) "Ten Counter-Intuitive Math Teaching Tips for Families with Older Kids." (KB)

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HAPPILY HOMESCHOOLING TEENS:

The Three R's

by Cafi Cohen

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DEVELOPING A WRITER'S TOOLKIT

By Cafi Cohen

As teenagers, our kids seldom did grammar exercises and never wrote reports and term papers. According to some in the educational establishment, they ought to be poor writers. Not so. Both got "A's" in their college freshmen English classes. Friends now often ask them for help editing assignments. Both enjoy writing and produce credible pieces for college classes as well as for real life purposes.

When we first began homeschooling Jeffrey and Tamara (ages 12 and 11 respectively), I already knew their strengths and weaknesses as writers. Jeff followed the rules of grammar and produced (what's a nice word here?) mechanical pieces. Although Tamara's creative stories entertained us, we struggled to understand them because they were so filled with grammar and usage errors.

In one way, I was probably a pretty typical beginning homeschooling parent. I saw my kids writing strengths, and I had identified the areas where each needed work. At the same time, and less typically, I think, I began to work on my own writing. I admired certain authors and wondered how I might develop my style and my voice.

In the beginning, I saw no relationship between trying to help my kids with their writing and improving the writing of an adult (me). For Jeff and Tamara, I looked for grammar exercises and creative writing assignments and topics for school-type reports. For me? I read good writing, and I wrote and rewrote, and I read about the processes of successful writers.

Successful authors, it turns out, *never* recommend diagramming sentences, memorizing verb tenses, taking spelling tests, and identifying parts of speech in random sentences. And they seldom advise using textbook writing techniques like identifying predicates and combining sentences by creating subordinate clauses.

Instead professional writers discuss developing leads, writing and rewriting, writing for real purposes, avoiding clutter, and choosing words. They talk about their writing toolkits – those practices that help them produce clean, informative, and entertaining poetry and prose.

Most significantly, successful authors describe writing as a *process*, not a product. Each writer says that his process, developed over a long period of time, is idiosyncratic; that is, his approach, often established through trial and error, is peculiar to him.

In reading about the practices of professional writers, I had to ask myself why I was trying to improve my (adult) writing one way (reading good writing, reading about writing, and writing and editing my work), and my teenagers' writing another way (with grammar exercises and pointless papers). And, of course, I had no good answer.

So I made a command decision: no more grammar exercises, punctuation drills, or assignments to write papers on meaningless topics. It was time to catalog and USE with my kids the techniques suggested by successful authors. It was time for all of us to learn by trial and error. It was time to create our Writer's Toolkit. And that was what we did.

Here is part of our Toolkit. Take what you can use and leave the rest.

READ GOOD WRITING

According to Gary Provost in his article, "The Seven Beacons of Excellent Writing" (in *The Writer's Digest Guide To Good Writing*), writers need the ability to recognize brevity, clarity, precision, harmony, humanity, honesty, and poetry

in others' writing to begin to discern it in their own.

A few of the titles that fit into this category that my kids liked included: almost anything by Roald Dahl, *Alice In Wonderland* by Lewis Carroll, *Gone With The Wind* by Margaret Mitchell, *America* by Alistair Cooke, *What Ever Happened To Penny Candy?* By Richard Maybury, *Diary of a Young Girl* by Anne Frank, *Reader's Digest* articles, and *All I Really Need To Know I Learned in Kindergarten* and other titles by Robert Fulghum.

If your kids will not read "good stuff," read it *to* them. Read together as a family. It is amazingly entertaining and generates wonderful discussions, in addition to exposing everyone to examples of good writing.

WRITE FOR REAL PURPOSES

Our kids' writing included articles and project proposals for the 4-H and Civil Air Patrol newsletters, public notices, journals, correspondence with out-of-state friends, computer bulletin board on-line notes, letters to the editor, contest entries, and – from my creative daughter – innumerable short stories and novellas.

My son, at about age 14, read about the amount *Reader's Digest* paid for short anecdotes like those featured in "Life in These United States," and decided to submit one. He labored over his 100-150 word piece, writing and rewriting, asking for editorial input, and worrying about punctuation. *Reader's Digest* did not publish the piece, nor did they publish 10-15 other pieces he wrote. But the goals (anticipated payment and publication) and focusing on real events created the motivation for Jeff to work hard on his writing.

THINK BEYOND PARAGRAPHS, REPORTS, AND ESSAYS

Nancie Atwell in her book, *In The Middle: Writing, Reading, and Learning with Adolescents*, lists approximately seventy types of writing that have emerged in her workshops for teenage writers. This Real Purpose writing includes jokes and riddles; reviews of books, records, plays, movies and TV shows; annotated calendars; scripts for plays and TV commercials; oral histories; resumes; song lyrics; diaries and journals; rules and regulations; instructions and advice; biographies; parodies, and much more.

Writing in your homeschool can encompass *all* Real World writing, not just paragraphs, reports, papers, and essays. If a teenager makes a shopping list, creates a recipe, and captions a scrapbook, it all fits under heading "writing" or Language Arts or English (for those of you who have to submit formal reports to school districts or umbrella schools).

WRITE WHAT YOU KNOW

Every good writer says this. Begin with your experience and build on that experience with research. For a long time, I had been fiddling with an article on foreign language study (one of the toughest areas for those homeschooling older kids). My research was thorough, but the article lacked credibility.

I finally realized what the problem was. I could *not* write the piece as an expert because, despite years of study, I was not fluent in a foreign language. But I could write from the perspective of someone who *wants* to become fluent in a foreign language. And I could write as someone who has interviewed language hobbyists and reviewed a myriad of techniques and resources. Sticking to what I knew, to my perspective, was the key.

Encourage your kids to write what *they* know, from *their* perspectives. Ask any teenager if she would prefer to write about her favorite sport or about ancient Mesopotamia. Unless ancient Mesopotamia is the subject of a recent-release movie, my guess is that you will

get a far livelier piece by focusing on what the kid knows.

INCLUDE WRITERS' VOCABULARY IN THE TOOLKIT

When some authors discuss improving writing technique, they use terms like nouns, verbs, adjectives, adverbs, prepositional phrases, parallelisms, semicolons, modifiers, danglers, antecedents, and tenses. Because those who write about writing use these terms, those of us who read these authors need to know the lingo, the tools of the trade.

Some homeschoolers will prefer to learn this vocabulary with a formal grammar program, like Wanda Phillips' *Easy Grammar* or Warriner's *English Grammar and Composition*. A good alternative, a short summary of "the rules" is Strunk and White's classic, *The Elements of Style*.

Other homeschooling parents will prefer to help their kids learn a writer's vocabulary in the context of the kid's writing. This means learning about nouns and verbs and correcting punctuation and usage errors as they appear each kid's writing samples. Nancie Atwell, in her book, *In The Middle*, describes this procedure in detail.

REVIEW AND REWRITE, REWRITE, REWRITE

Most published magazine pieces are the result of at least two or three revisions, often ten to twenty revisions. At first, almost all teenagers will resist rewriting anything, so call the first effort a draft to encourage thinking of it as something that needs revising. Again, Nancie Atwell's book is an invaluable guide to critiquing your kid's writing and posing questions that will help him see the need for rewriting.

As your teenager's writing becomes more sophisticated, he may want outside input. Encourage him first to submit his pieces to other local adults whose opinions about writing you respect. Eventually, your older kid may want to find a writing mentor. Homeschooler Amanda Bergson-Shilcock and Susannah Sheffer, editor of *Growing Without Schooling*, taped a fascinating presentation, "Finding A Mentor: Our Journey," at the GWS 1997 Conference (tape available at 617 864-3100). The discussion shows how valuable a writing mentor can be for a young author and describes how to find one.

My recent experience with this column illustrates another reason to seek outside input. Other readers can help you avoid looking Really Stupid! I submitted a piece on volunteering a few months ago. We were in the middle of moving preparations; and, counter to my usual procedure, I did not ask anyone else to read the column before submitting it. Unfortunately, the piece contained a glaring logical inconsistency, which one of the readers rightly called me on in the September-October issue. I had actually noticed the inconsistency a few weeks after submitting the column, but it was too late for revision.

READ ABOUT REAL WRITERS' PROCESSES

There is no One Right Way to begin a paragraph, research topics, organize material, or edit papers. Some writers only define their objectives after they begin writing a piece. Like me, they use writing to clarify thinking and discover their themes. Others work from detailed outlines with all content defined in advance.

Some authors edit for content and mechanics at the same time. Others worry about content first and address mechanics later. Many famous authors dictate everything and leave the transcription and punctuation to someone else. Others have to work with certain pens and specific types of paper. Many could not produce anything without a word processor.

Because there is No One Right Way to improve writing, build a writer's toolkit by exploring the varied ways different individuals approach their writing (see Resources at end of article). Among the incredible variety of real writing processes will be tips and hints that will appeal to you and work for your kids.

ADDRESS WRITER'S BLOCK

In reviewing successful authors' processes *and* by trial-and-error, we learned a few techniques to overcome writer's block.

Brainstorming heads the list. Let's say your homeschooler wants to enter a non-fiction contest but cannot decide on subject. He begins by simply writing down all the possible subjects that are part of *his* experience (e.g. skateboards, hiking, action movies) and then lists ideas he associates with each subject. It is fun to do this as a family or with a group. Many find that discussing topics helps them decide on a theme.

Another aid to writer's block, especially for some boys who simply hate the process of putting pen to paper, is dictation. You say your kid will *not* keep a journal? Have him emulate the many great writers who dictate everything. Your teenager can orally review the previous day while you write or type. Alternatively, he can dictate onto a cassette tape and transcribe it himself. In either case, he has done the tough part, articulating the ideas. Separating the two processes – description from transcription – overcomes many cases of writer's block.

Keyboarding skills and word processors are also part of our Writer's Toolkit. Our son began writing more consistently once his keyboarding skills allowed him to bypass pencil and paper. And, of course, word processors enable all of us to endure and even sometimes enjoy the revision process. Grammar checkers on word processors actually taught our kids some usage principles I had given up on.

Some homeschooling parents credit communicating via modem --writing e-mail and contributing to various computer bulletin boards -- with stimulating an interest in writing when all else failed. I myself generate reams of first-draft material on homeschooling computer bulletin boards. Of course, you need to exercise caution with the Internet, but the possibility of helping your kids find others with compatible interests and *writing* about those interests is probably worth your extra time.

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You have a wealth of resources available to help you with your older kids' writing. The suggestions here are merely a beginning. Do peruse some of the readings listed in the following resources. Most are not new and should be available through the library.

Once to you have expanded your Writer's Toolkit, you will be in a better position to help your kids. Try the different successful approaches that you read about. Let trial and error work for you and your teenagers. Finally, allow your kids time to find their own voices, using processes that work for them.

See RESOURCES FOR WRITING on next page.

RESOURCES FOR WRITING

The Elements of Style by William Strunk, Jr. and E.B. White: Tiny volume is a powerhouse of grammar and usage.

Real Lives: Eleven Teenagers Who Don't Go To School edited by Grace Llewellyn: Read essays by eleven homeschooled teenagers, published authors all!

In The Middle: Writing, Reading, and Learning with Adolescents by Nancie Atwell: Detailed suggestions for responding to your kids' writing; super appendix lists include writing contests and publications that accept writing from teenagers.

Writing Because We Love To: Homeschoolers At Work by Susannah Sheffer: Practical suggestions for helping writers aged 10-15 with the writing process.

On Writing Well: An Informal Guide To Writing Nonfiction by William Zinsser: One of my favorites. Intended for adults but so well written, most teenagers will enjoy it as well.

How To Write Fast (While Writing Well) by David Fryxell: Great advice on everything from researching to generating exciting opening paragraphs.

Edit Yourself: A Manual For Everyone Who Works With Words by Bruce Ross-Larson: Two column format helps writers identify problems (first column) and generate fixes (second column).

"Our national tendency is to inflate and thereby sound important. The airline pilot who announces that he is presently anticipating experiencing considerable precipitation wouldn't dream of saying that it may rain. The sentence is too simple—there must be something wrong with it.

But the secret of good writing is to strip every sentence to its cleanest components. Every word that serves no function, every long word that could be a short word, every adverb that carries the same meaning that's already in the verb, every passive construction that leaves the reader unsure of who is doing what—these are the thousand and one adulterants that weaken the strength of a sentence. And they usually occur, ironically, in proportion to education and rank."

--William Zinsser, *On Writing Well*

ENCOURAGING READING

by Cafi Cohen

Denise is just this side of panic. She has recently taken her 14-year-old son out of school because he still cannot read anything except the most basic material. How will he ever make a living?

Marcia has a different problem. Her 13-year-old daughter seems stuck in second gear. For more than a year, her homeschooler has restricted her reading to the books of only two authors. On a charitable day, Marcia calls this material kiddie junk fiction. How can Marcia get her daughter to try a biography or poetry or even a how-to book?

Dan faces yet a third challenge. He wants to ensure two things: that his teenagers have a broad educational base and that they are well prepared for college.

I believe that all of these parents' concerns can be addressed with some of the same approaches. Over the years – by talking to other parents, by observing hundreds of homeschooling families, and by trial and error – we discovered a number of techniques that encourage reading (for non-readers and reluctant readers) and that stimulate kids to try more diverse and challenging materials, including some of the classics. Here is my short list.

VOLUME AND VARIETY

Accumulate a lot of reading material. Build a good home library by frequenting garage sales (books for pennies), library sales, school giveaways. We found that large school districts, especially, scrap great stuff. They do not know what to do with a book like *Little House On The Prairie* because it lacks a study guide. Call your district and ask what they do with discards.

Think variety in building your home library. The classics are nice, but also include current fiction for all ages, biographies, how-to manuals, poetry and short story collections, popular history and science books, reference books, magazines, and catalogs.

THE TRIP FACTOR

Make reading material accessible in your home. Avoid hiding books in closed cabinets and closets. Put them out -- on coffee tables and convenient bookshelves, next to the tub, even in the middle of the floor. I wish I had a nickel for every time my kids started reading something they "accidentally" discovered in our home. Surreptitiously arranging for our teenagers to trip over a new title was much more effective than recommending it.

LOCATING GOOD READS

Teach your kids the basics of locating good books. Make certain they can use the library card catalog to find material on favorite subjects and by favorite authors. Most kids discover that if they like a certain book, a second book by the same author will probably appeal to them just as much. But often kids overlook asking the librarian or friends for recommendations of similar authors: "I like Roald Dahl's books; who writes similar fiction?"

Introduce your older children to annotated reading lists and book reviews.
Your librarian can help you find reading lists with comments for each recommended title. As a starter for book reviews, read the *Home Education Magazine* column "So Many Books," and discuss which books would be fun to try. My favorite reviews are at www.amazon.com, a large on-line bookstore that features comments by both professional reviewers and interested readers.

Grace Llewellyn (in *The Teenage Liberation Handbook*) says, "Cultivate the habit of browsing." Teach your kids (by example) to wander around the library or a large bookstore and grab what looks interesting. To save money, I browse bookstores with a pencil and paper and make lists of items to request at the library. Browsing on-line, at www.amazon.com or other sites, raises bookstore browsing to a new, efficient, fun level.

RESPECT KIDS' READING CHOICES

Many new homeschooling parents worry about grade-level reading, finishing everything, covering the classics, answering "comprehension" questions – in other words, didactic approaches to reading. If you want a home full of avid readers, I would encourage you instead to respect your kids' reading choices.

Do not worry about grade level (assuming you can figure out what constitutes a given grade level). Some material your teenagers choose may be too difficult (that's how readers build vocabulary and reading competence). Other books may be too easy (that's where readers learn to read for enjoyment, when the "tasks" associated with reading disappear).

Also, do not worry about incomplete reads, that is, discarding a book before finishing it. I used to ask our kids to give everything a 10% chance. A 10% chance means that you read 10% of a book or article – give it a fair trial – before you give up on it. For a 230-page book, that would be 23 pages. If the 230-page book bored you silly for the first 23 pages, there is little likelihood you will get anything out of it. Proceed to something else. As more than one tee shirt and coffee mug has informed me: so many books, so little time.

Similarly, in our home, we did not discourage re-reading. Both my kids read certain books over and over. They both said that every time they re-read a selection, they found something new to consider and came afresh to appreciate the author's form and style.

FAMILY READ ALOUD

A staple of educating younger children is Read To Me. It works great with older kids as well. Pick titles that the whole family can enjoy. Reading aloud is a wonderful way to explore poetry and prose. You can also use it to introduce classics, unfamiliar subjects, and other material your teenagers might not select for themselves. Some books we began as read-alouds, the kids – not wanting to wait for the next installment – finished on their own.

DINNER

We loved discussing books over meals. Our kids tried many different titles after hearing their father and I dissect plot, characters, and style. Your reading – and particularly your *talking about reading* – may stimulate your kids. Dinnertime discussion is a way for parents to provide what teachers call "advance organizers." An advance organizer is – roughly speaking – an overall description of the book, its characters, its themes. It makes it easier to read the book, especially a challenging one.

CONDUCIVE ENVIRONMENT

Make certain that your home is conducive to reading. More specifically, make certain there are quiet areas where kids can read. This may mean limiting numbers of TV's, time TV is permitted, and so on. Often when I meet parents who complain that their kids "never read," I find a TV in every room of the house or a TV blaring all day long.

PRETTY PACKAGES

When I was a teenager (in the 1960's), I often fingered a copy of Jane Austen's *Sense and Sensibility* at the public library.

I probably even checked it out once or twice, but I never got past the first paragraph in the heavy, dark, forbidding-looking hardbound book. Sitting on my desk today, I have a Dover Thrift Edition of the same book. This paperback is attractively bound, lightweight, 261 non-intimidating pages. What a difference. I know, in this format, I would have read this book as a teenager. They say, "Don't judge a book by its cover." But I do.

And I suspect most teenagers do. Stay away from literature texts for that reason. Can anyone enjoy anything between the covers of a 10-pound book? Can anyone fail to enjoy something like the Dover Thrift Editions, which are so sensually pleasing?

READING GROUPS

Encourage your teenagers to form reading groups. Generally, these groups meet monthly to discuss a previously-agreed-upon title. Reading groups, intergenerational or composed only of other teenagers, encourage all readers to articulate their thoughts about the reading selection. Often your kids will plough through a classic for a reading group that they would never attempt on their own. It is fun to learn how many different ways readers of the same book interpret it.

BOOKS ON TAPE

More and more, we are seeing books on tape in bookstores and at our local library. These are great for slow and reluctant readers as well as for those who want to be introduced painlessly to a new genre or subject. I have known several homeschoolers who "covered" a fair number of classics – all on tape. We also found books on tape an interesting way to pass the time on long car trips.

I have met more than one homeschooler (with severe dyslexia) who learned almost everything from books on tape. Books on tape are educational lifesavers for true dyslexics, for those with compromised vision, for kids who learn better through the auditory channel, and even for some hyperactive kids who need to move around a lot all the time.

COVERING THE CLASSICS

Is there a list of classics and must-reads for the high school years? How about college preparatory books? Actually, there are hundreds (thousands?) of recommended reading lists (just check the Internet or ask your librarian for one pertaining to teenagers and college prep). And none of them cite the same list of books. No list is definitive; there are no Must Reads, no books whose lack will create The Great Educational Hole.

The principal value to such lists is that they constitute another source of ideas for reading. What to try next – for family read aloud, for the teenager seeking a challenge, for a reading group, for books on tape – what to try next may come from one of these lists. Also, perusing these lists shows you what impresses college admissions officers. Just do not feel that any one title is mandatory. If your teen is having trouble with a certain recommended book, you can always find something equally impressive he will enjoy more. Just use the 10% trial rule and shop around!

SEE THE MOVIE

Occasionally, perhaps for an independent-study course or out of sheer curiosity, your teenager will need or want to tackle something that he finds incomprehensible. To make it through these titles, try the following advance organizers.

*See the movie. My daughter came to love many Shakespeare plays after seeing the corresponding movies. My son made it through *MacBeth* (required for an English Literature correspondence course) after seeing the movie three times.

*Listen to the tape. The entire selection or an abridgement may be available on books on tape. Many selections that seem

incomprehensible in written form come to life on tape.

*Read the Cliff's notes (available at large bookstores or college bookstores) or similar summaries. Cliff's notes are synopses of commonly read classics. I also like the summaries in *The Great American Bathroom Book*, Volumes I, II, and III (originally published as *Compact Classics*).

*Read reviews plus the first chapter and last chapter of a difficult title – and call it good. The reviews can provide you with the plot and characters of a required reading; the first and last chapters give you a sampling of the author's style.

LOG IT!

Recordkeeping is an important incentive for some kids. Reading logs are fairly easy to keep and can develop into impressive documentation for college applications. Like scrapbooks, we enjoyed perusing these logs several years later. I suggest that all homeschoolers begin keeping a reading log at age 12 or 13, if not earlier.

What goes in the log? Just three columns – unless your kid wants to do more. The columns are Author, Title, and Rating, 1-10: 1 being a book not completed because it was so boring/incomprehensible, and 10 being a book so great it will be re-read often.

A Few Selections At Least One of Our Kids Read More Than Once

Alice's Adventures In Wonderland by Lewis Carroll
Matilda and other titles by Roald Dahl
Novels by Michael Crichton
Guiness Book of World Records
All I Ever Needed To Know I Learned In Kindergarten by Robert Fulghum
Rocketry Catalogs
Fun Games for Great Parties by Maralys Wills (a how-to book)
The Hobbitt by J.R.R. Tolkein
Diary of a Young Girl by Anne Frank
Much Ado About Nothing by Shakespeare
Animal Farm by George Orwell
Maus I and *Maus II* by Art Spiegelman
Not Without My Daughter by B. Mahmoody
Gone With The Wind by Margaret Mitchell
Whatever Happened To Penny Candy? by Richard J. Maybury
Life Goes To The Movies, Time-Life Books
Newsweek Magazine
Games Magazine

Sampling of Titles From High School/College Prep Reading Lists

Huckleberry Finn by Mark Twain
A Tale of Two Cities by Charles Dickens
I Know Why The Caged Bird Sings by Maya Angelou
Frankenstein by Mary Shelley
Dune by Frank Herbert
Cry, The Beloved Country by Alan Paton
The Robe by Lloyd C. Douglas
Walden by Henry David Thoreau
The Crucible by Arthur Miller
Pride and Prejudice by Jane Austen
"The Masque of The Red Death" by Poe
"The Lottery" by Shirley Jackson
Poetry by Robert Frost

RETHINKING MIDSCHOOL/HIGH SCHOOL MATH

by Cafi Cohen

M-A-T-H. What thoughts come to mind with the word MATH? One of the three R's. A government school required subject, according to many state statutes and regulations. An essential topic in any homeschool.

Past that point, what official guidance are you given for teaching math? Often, none. What you cover and how you cover it is up to you. In the absence of specific directions, many homeschooling families pursue what I call School Math. School Math is how most parents studied math when they attended school; and it is how most schools still teach math.

TRADITIONAL INSTRUCTION

School Math involves textbooks, workbooks, and exams. Older kids pursuing School Math study the subject sequentially – in other words, arithmetic, followed by algebra, then geometry, second year algebra, trigonometry, and so on. Those using a School Math program must always "show all the steps" and reason exactly like the textbook reasons. Alternate approaches to problem solving are unacceptable. Getting the right answer is emphasized, often to the exclusion of understanding the process.

School Math texts often include unrealistic problems. Typical is the following. A 20-ft. telephone pole falls across a street and the two ends extend one foot and three feet either side of the street. How wide is the street?

That's it. A real problem from a real math text. It makes me wonder. When would a person ever measure a street this way? And why? Ambiguous situations are a second deficiency illustrated here. How do we know the telephone pole is perpendicular to the street? Obviously, the "correct" answer would vary with the angle between the pole and the street.

A steady diet of School Math also often means that math applications (using math in Real Life situations) are accorded supplementary status. Kids whose math experience is dependent on texts do real life math seldom – if and only if they complete an exhausting set of math text problems.

Given all this, we homeschooling parents have to ask ourselves, is school math the right way to inculcate mathematical skills and processes?

Let's look at the evidence. With respect to formal math instruction, 80+% of high school graduates in the United States get no further than consumer math, general math, and introductory algebra (this ignores the 30% of the teenage population that doesn't graduate at all). Of those students who do graduate, a majority need cash register picture keys to add up purchases and make change. Sometimes, even the best math students, those who take the advanced math courses, forget how to accomplish basic tasks like calculating a percentage or cutting a recipe in half. Scores on the math portion of the Scholastic Aptitude Test (a college entrance exam) continue to decline.

When I speak to groups of adults, I sometimes ask how many fear or dislike math and how many consider themselves math-phobic or math illiterate. Consistently 1/3-1/2 of any adult audience identifies themselves as having a strained relationship with the topic.

So, given all this – the relatively low level of formal math course completion, the lack of math application skills, poor

standardized test performance, and pervasive math anxiety in the general population – we home educators have to ask ourselves: do we want to copy a method that yields these results? Do we gain anything by patterning our homeschooling after the programs of the educational establishment?

I don't think so. Emulating a failing system is not the way to go. Fortunately, as homeschooling families, we have the latitude to try something else.

We homeschooled two kids from grades six and seven through grade twelve and eventually enjoyed success with the math "program" we developed. We began as many of you probably did: with textbooks and workbooks and tests and grades; with lessons and problems every day; with pencils and paper and rulers and protractors; and almost always, with serious, sometimes grim looks on our faces.

ALTERNATIVE TOPICS

As we progressed through early middle school math (prealgebra), we spent less time with the texts and more time on topics most schools consider supplementary. These included:

*Consumer math and everyday accounting

*Math applications (also called hands-on or real life math)

*Mental math

*Recreational math (math games)

*Probability and statistics

*Calculator math

*Math history

And, as I observed my kids' reactions to these topics, we changed our emphasis, and My Ideal Math Program evolved. My Ideal Math Program consists of equal proportions of textbook math and alternative math activities (those "supplementary" topics listed above).

AN INTEGRATED APPROACH

Our kids spent approximately half their time with instructional math program materials with which we are all so familiar (we used Saxon Math, but any program which your teenager thinks is straightforward and clear is acceptable). And fully half of our kids' math time was devoted to the other topics listed above.

We found that alternating the emphasis weekly – one-week program math, one week alternative math – worked out well for us. You may find that daily or monthly or even randomly timed alterations fit your situation better.

An example of this approach for a seventh grader follows. On week one, the kid completes one lesson daily of Saxon Math 76. On week two, she works on a 4-H Project that incorporates consumer and hands-on math. On week three, she returns to Saxon Math. On week four, she works with mom on mental math techniques. On week 5, it's back to Saxon. On week 6, we play math games each day.

How will your kid complete his program text if he's only doing it half the time? A good question. What we found was that our kids did not need to do every problem in the text. Because of time spent with alternative materials, our kids grasped and mastered text concepts and operations more readily. With a program like Saxon, I would recommend that kids try reading all the lessons, but only do every other problem set.

What about a tenth grader using Key Curriculum Press materials as the formal math program? On week one, he works 30-45 minutes daily on *Key To Geometry*. Week two, he plays games taken from the book *Family Math* each day. Week three, he is once again working on the Key To . . . book. Week four, he works on the

accounting for his lawn-moving business and plays with the techniques in a calculator math book. And so on.

BRANCH OUT!

I am recommending an approach that integrates textbook math with topics like hands-on math and recreational math and puts them on an equal footing. Some regard this as radical thinking. Why should you consider it? Here are five reasons.

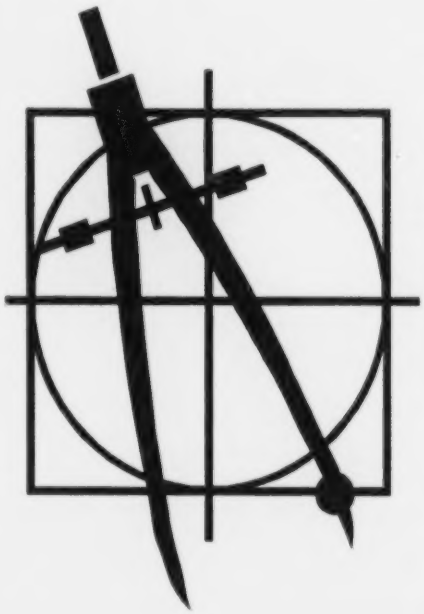
First, an integrated approach increases the likelihood your kid will cover math topics in which your program may be weak. No one text is perfect; no program complete, regardless of the advertising. Your program may do a superb job explaining concepts but lack good drill material. Or it may be drill-heavy and come up short in problem solving or hands-on activities. As an example of a deficiency of some higher level math programs, your Algebra II or Trigonometry text may omit statistics and probability.

Point two. Alternative math materials and activities help students relate math to The Real World and acquire skills they will use throughout their lives. Kids learn to estimate gallons of paint needed for a room by running through the calculations and then trying them out (in this case, painting the room). They master budgeting and balancing checkbooks by helping you juggle (or even taking responsibility for) the family finances. They will never forget how to obtain price per unit after they have stood in a store aisle with the calculator and crunched the numbers several times.

Third, alternative activities and materials encourage a problem-solving, can-do attitude. That is, after all, the goal of all the school math programs: teaching kids to solve real world problems. Unfortunately, many school programs have gotten lost in their own didacticism. We don't have to.

Fourth, an integrated approach may be the best way to reach the math phobic teenager and the kinesthetic (hands-on) learner. The alternative materials may be the only things that get through to the math-phobic kid. And the kinesthetic learner will probably understand his text material only after he has had the chance to "play" with hands-on math materials.

Finally, incorporating hands-on and real life and recreational math materials into your program can help you and your student feel more relaxed about math. Math games are fun. Homeschooling catalogs carry many recreational math games, but often you need not look any further than your hall closet. Monopoly, for example, provides excellent practice and review of the four basic arithmetic operations, lots of mental math, as well as fractions, decimals, and percents. Frequent Monopoly players retain "easy" math skills. They do not forget how to calculate 10% mentally just because they happen to be studying geometry this year.



TEN COUNTER-INTUITIVE MATH TEACHING TIPS FOR FAMILIES WITH OLDER KIDS

by Cafi Cohen

1.Study topics "out of sequence," especially if your teenager demonstrates an interest. Kids with barely adequate arithmetic skills are often fascinated by introductory algebra and geometry. Don't wait on these subjects. I have seen homeschoolers automate their arithmetic skills only after they began algebra

2.Choose materials cooperatively with your older kid. When s/he tells you something is not working, look for another text, another approach, other materials.

3.Recognize that plateaus (periods when it seems no progress is being made) are a part of all learning. Take breaks from all math occasionally. It is amazing what your homeschooler will do after a period of no formal math instruction.

4.Manipulatives (hands-on materials) are not just for younger children. Continue to use manipulatives for all math word problems until your homeschooler tells you they are "getting in the way." You need not spend a fortune on these items. Almost any math word problem can be modeled with kidney beans, construction paper cut-outs, pennies, Monopoly money, M&M's, egg cartons, tooth-picks. Try it – you'll see.

5.Let your older kid "see" your problem solving process in The Real World. When you figure out how much the new carpet will cost or how long it will take to drive to Chicago, do it out loud, on paper, slowly, and together.

6.Accept alternate approaches to problems if these alternatives consistently yield valid results. There's nothing sacred about textbook approaches, even to such basic tasks as adding and subtracting. If your homeschooler develops an approach that works as well or better, encourage him to use it.

7.For the math-phobic learner ("If it's math, I can't do it."), do his text math with him, side-by-side, in tandem. It may take one to two years, but eventually he will tell you to "get lost."

8.Encourage calculator use, beginning with algebra. There's nothing worse than not learning the algebra because the student is spending hours with division and multiplication that no one in the Real World would do by hand.

Also, try a reverse psychology method of instilling arithmetic facts with the math phobic learner: insist that he use a calculator for all math drill sheets, even for those problems he can do without the calculator. Do the same sheets over and over. When your homeschooler tells you the calculator is slowing him down, he has learned more facts.

9.Discourage calculator use for all operations that are more quickly done using estimation or mental math techniques or just paper and pencil (e.g. multiplying 35 times 100).

10.Do lots of real life math. Examples? Estimating mileage after filling the gas tank, calculating a 15% tip, doubling a recipe, constructing a family budget, checking a bank statement or a pay stub, interpreting IRS regulations (for the very ambitious!).

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Cafi Cohen, homeschooling mom, is the author of ***"And What About College?" How Homeschooling Leads To Admissions To The Best Colleges and Universities, 2nd Edition*** (Holt Associates, 2000) and ***Homeschooling: The Teen Years*** (Prima, 2000). She writes columns for *Home Education Magazine, Homeschooling Today,* and the *LINK*. Her website, Homeschool-Teens-College, contains helps for families homeschoooling 11-18 year-olds at www.homeschoolteenscollege.net. She also presents workshops at homeschool conferences nationwide. For more information about Cafi's books and workshops, contact her at: 805 473-4963 or 473-9045 or at cfcohen@pacbell.net.

Distance runners have good advice for home educators: "Start slowly and then ease up!"

--Cafi Cohen, 1997